

KRAUS, N., Dr.; FOGAS, Aurora, dr.; FOGAS, C., dr.

Epidemic and sporadic eosinophilia. Med. int., Bucur. 4 no.8:
1233-1236 Dec 56.

1. Lucrare efectuata la Spitalul de adulti si de copii din Arad.
(EOSINOPHILIA
epidemic & sporadic, etiol. & manifest.)

KRAUS, N., Dr.; FOGAS, Aurora, dr.; FOGAS, C., dr.

Epidemic and sporadic eosinophilia. Med. int., Bucur. 4 no.8:
1233-1236 Dec 56.

1. Lucrare efectuata la Spitalul de adulti si de copii din Arad.
(EOSINOPHILIA
epidemic & sporadic, etiol. & manifest.)

FOGAS, Kornel, Dr.; ACEL, Henrik, Dr.

Primary sympathicoblastoma of the greater omentum. Orv. hetil. 100 no.10:
367-368 8 Mar 59.

1. Az Aradi Jarasi Korhaz kozlomenye.

(NEUROBLASTOMA, case reports

sympathicoblastoma of greater omentum, primary (Hun))

(OMENTUM, neoplasma

sympathicoblastoma of greater omentum, primary, case report
(Hun))

FOGAS, Pal (Szentcs)

Among trackmen. Munka 14 no.12:33 D '64.

FOGEC, Zvonko, mr

Activities of the Section for Industrial Pharmacy.
Farmaceut gl Zagreb 19 no. 12: 486-488 D '63

*

FOGEC, Zvonko, mr

First Technical Conference on Packaging in Pharmacy. Pharmaceut
gl Zagreb 20 no.9:328 S '64.

1. Secretary, Section of Industrial Pharmacy of the Federation
of Pharmaceutical Associations of Yugoslavia.

Poland/Virology. Viruses of Man and Animal

E

Abs Jour : Ref Zhur-Biol., No 13, 1958, 57345

Author : Makower Henryk, Skurska Zofia, Fogel Alicja,
Wielgus Krystyna

Inst : ~~Not given~~ *Olsow*

Title : Study of the Viruses of Parapoliomyelitis.
Report 1. Virus of Columbia MM

Orig Pub : Arch. immunol. i terap. doswiadc., 1955, 3,
311-345

Abstract : The strain which was received from Stockholm
was highly virulent to newlyborn and grown mice,
but lost its infectious properties when systema-
tically passed through these animals. The virus
accumulated primarily in the spinal cord; in
the brain it concentrated more in the cerebel-
lum than in the hemispheres. It did not repro-

Card 1/3

*Institute Immunologii i Terapii Doświadczalnej
PAN we Wrocławiu (Director: prof. Dr. L. Hirsfeld)
Dział Wirusologii (Kierownik: prof. dr. H. Makower)*

Poland/Virology. Viruses of Man and Animal

13

Abs Jour : Ref Zhur-Biol., No 13, 1958, 57346

Abstract : duce in the allantoic cavity, but did multiply in the amniotic area with rising virulence. Recovered mice acquired immunity which increased after a second infection. However, sera from mice which recovered from infections or from immunized animals did not neutralize the virus. The virus possessed hemagglutinating properties (HP). No parallelism between HP and infectious properties was established. The same immune serum did not always equally inhibit the hemagglutination reaction with different brain suspensions having similar hemagglutination titers. On the investigation of 473 sera of persons in Lower Silesia it was found that in the group of persons recovered from poliomyelitis there were 2.4 more positive RTGA than in the group that did not contract the disease. Hence, the authors

Card 2/3

Poland/Virology. Viruses of Man and Animal

E

Abs Jour : Ref Zhur-Biol., No 13, 1958, 573-6

Abstract : conclude that there is a possibility that
viruses of the encephalomyocarditis group
play a possible role in the etiology of polio-
myelitis.

Card 3/3

Poland/Virology. Viruses of Man and Animal

E

Abs Jour : Ref Zhur-Biol. , No 13, 1958, 57347

Author : Skurska Z., Makower H., Fogel A., Guzy K.
Inst : Not given
Title : Study of the Viruses of Parapoliomyelitis.
Report 11. Virus Tward.

Orig Pub : Arch. immunol. i terap. doswiadc., 1955,3,
481-598

Abstract : From the feces of a 1½ year old child with symptoms of poliomyelitis the virus Tward was isolated by means of the intraperitoneal infection of newborn mice. The virus belongs to the group of encephalocarditis viruses which serologically and by their infectious and hemagglutinating properties are similar to the virus Columbia MM. After the 11th passage the virus began to

Card 1/2

Poland/Virology. Viruses of Man and Animal

E

Abs. Jour : Ref Zhur-Biol., No 13, 1958, 57347

Abstract : produce the diseases in grown mice. The sera of poliomyelitis patients in 21% of the cases inhibited the hemagglutination reaction with virus Tward. Of the 56 sera from poliomyelitis patients which were investigated, 5 sera inhibited RTGA with the virus Tward, but not with the Columbia MM virus. The serum from a child from whom virus Tward was isolated did not inhibit hemagglutination reaction by this virus and did not neutralize it.

Card 2/2

FOGEL, A.A.

(Deceased)

(Geophysics)

See ILC

FIGEL', I. A.

Industrial use of high-frequency currents. Leningrad, Gos. nauchno-tekhn. i obshchestven. nauchno-tekhn. lib-ry Leningrads'ko obd-nie 1952. 70 p. (55-36963)

TK46C1.F6

FOGEL', A.A.

Prospects for the utilization of electromagnetic energy with a centimeter wave band. [Isdaniia] LONITOMASH no.30:27-46 '52. (MIRA 8:1)
(Industry heating) (Microwaves)

¹
SHEKALOV, A.A.; SHTREYS, Ya.I.; FOGEL', A.A., kandidat tekhnicheskikh nauk, redaktor; BLINOV, B.V., inzhener, retsenzent; SOKOLOVA, L.V., tekhnicheskiiy redaktor.

[Smelting in coreless-type induction furnaces] Plavka v besserdechnikovyykh induktsionnykh pechakh. Pod red. A.A.Fogelia. Moskva, Gos. nauchno-tekhn. iss-vo mashinostroit. i sudostroit. lit-ry, 1954. 29 p. (Bibliotekhka vysokochastotnika-termista, no.14) (MLRA 7:11) (Induction heating) (Smelting)

GOLOVIN, G.F.; FOGEL', A.A., kandidat tekhnicheskikh nauk, redaktor;
ZAMYATNIN, M.M., kandidat tekhnicheskikh nauk, retsenzent;
SOKOLOVA, L.V., tekhnicheskiiy redaktor.

[Structure and properties of steel products tempered by high
frequency heating] Struktura i svoistva stal'nykh izdelii, za-
kalennykh pri vysokochastotnom nagreve Pod red. A.A.Fogelia.
Moskva, Gos. nauchno-tekhn. izd-vo mashinostroit. i sudostroi.
lit-ry, 1954. 34 p. (Biblioteka vysokochastotnika-termista,
no. 4) (MIRA 7:11)

(Induction heating) (Steel--Metallography)

HUDENKO, D.I.; FOGEL', A.A., kandidat tekhnicheskikh nauk, redaktor;
SPITSYN, M.A., kandidat tekhnicheskikh nauk, retsentsent;
SOKOLOVA, D.V., tekhnicheskiiy redaktor.

[Development of high-frequency heating technology] Razvitie
tekhniki vysokochastotnogo nagreva. Pod red. A.A.Fogelia.
Moskva, Gos.nauchno-tekhn.isd-vo mashinestroitel'noi i
sudostroitel'noi lit-ry, 1954. 37 p. (Bibliotekhka vysoke-
chastotnika-termista, no.1) (MLRA 9:1)
(Heat engineering)

SLUKHOTSKIY, A.Ye.; FOGEL', A.A., kandidat tekhnicheskikh nauk, redaktor;
VASIL'YEV, A.S., kandidat tekhnicheskikh nauk, retsenzent; SOKOLO-
VA, L.V., tekhnicheskij redaktor.

[Inductors for hardening]. Zakolochnye induktory. Pod red. A.A.Fogelia.
Moskva, Gos.nauchno-tekhn. izd-vo mashinostroit. i sudostroit. lit-ry,
1954. 46 p. (Biblioteka vysokochastotnika-termista, no.6)(MLRA 7:11)
(Induction heating) (Metals--Hardening)

FOGEL, A. A.

VOLOGDIN, V.I.V.; KOROBKOV, A.V., kand.tekhn.nauk, retsenzent; FOGEL', A.A.,
kand.tekhn.nauk, red.; SOKOLOVA, L.V., tekhn.red.

[High-frequency soldering] Vysokochastotnaia paika. Pod red.
A.A.Fogelia. Moskva, Gos.nauchno-tekhn.izd-vo mashinostroit.
i sudostroit. lit-ry, 1954. 49 p. (Bibliotekha vysokochastotnika-
termista, no.13) (MIRA 11:7)
(Solder and soldering)

VASIL'YEV, A.S.; KONDRATSKIY, A.A.; FOGEL', A.A., kandidat tekhnicheskikh nauk, redaktor; SPITSYN, M.A., kandidat tekhnicheskikh nauk, retsenzent. SOKOLOVA, L.V., tekhnicheskiiy redaktor.

[Vacuum-tube generators for high frequency heating] Lampovye generatory dlia vysokochastotnogo nagreva. Pod red. A.A.Fogelia. Moskva, Gos. nauchno-tekhn. izd-vo mashinostroitel'noi i sudostroitel'noi lit-ry, 1954. 50 p. (Biblioteka vysokochastotnika-termista, no.9) (MLRA 7:12)
(Induction heating)

GLUKHANOV, N.P.; FOGEL', A.A., kandidat tekhnicheskikh nauk; redaktor;
VASIL'YEV, A.S., kandidat tekhnicheskikh nauk; retsentsent; SO-
KOLOVA, L.V., tekhnicheskiiy redaktor.

[Physical principles of high-frequency heating] Fizicheskie osno-
vy vysokochastotnogo nagreva. Pod red. A.A.Fogelia. Moskva, Gos.
nauchno-tekhn. izd-vo mashinostroit. i sudostroit. lit-ry, 1954.
54 p. (Biblioteka vysokochastotnika-termista, no.2) (MLRA 7:11)
(Induction heating)

ZHEZHERIN, R.P.; FOGEL', A.A., kandidat tekhnicheskikh nauk, redaktor;
SOKOLOVA, L.V., tekhnicheskiiy redaktor.

[Alternators for high-frequency heat treatment of metals] Mashin-
nye generatory dlia vysokochastotnogo nagreva. Pod red. A.A.Fogelia.
Moskva, Gos.nauchno-tekhn. izd-vo mashinostroit. i sudostroit. lit-
ry, 1954. 58 p. (Bibliotekhka vysokochastotnika-termista, no.8)

(MLRA 7:11)

(Dynamos--Alternating current) (Metals--Heat treatment)

FOGEL', A.A.

Using high-frequency heating for drying and improving the sowing
qualities of seeds. [Izd.] LONITOMASH no.33:249-273 '54.

(Seeds drying)

(MLRA 8:2)

FOGEL, A. A.

"Melting, Not in a Crucible, But by Induction-Heating" lecture given at the International Metallurgists' Conference, Moscow 26-30 June 56

Source CS-3,302,240, 11 Jan 57.

24(8) PHASE I BOOK EXPLOITATION SOV/2117
Soveshchaniye po eksperimental'noy tekhnike i metodam vysokotemperaturnykh issledovaniy, 1956

Experimental'naya tekhnika i metody issledovaniy pri vysokikh temperaturakh: trudy soveshchaniya (Experimental Techniques and Methods of Investigation at High Temperatures; Transactions and Reports of the Scientific Conference on Experimental Techniques and Methods of Investigation at High Temperatures) Moscow, AN SSSR, 1959. 208 p. (Series: Khimicheskaya nauka SSSR. Institut metallurgii. Kniha po fiziko-khimicheskimi osnovam proizvodstva stali) 2,200 copies printed.

Resp. Ed.: A.M. Samarin, Corresponding Member, USSR Academy of Sciences; Ed. of Publishing House: A.L. Bankovskiy.

PURPOSE: This book is intended for metallurgists and metallurgical engineers.

COVERAGE: This collection of scientific papers is divided into six parts: 1) thermodynamic activity and kinetics of high-temperature processes; 2) constitution diagrams; 3) physical properties of liquid metals and alloys; 4) new alloys; 5) methods and production of pure metals; 6) pyrometry; and 7) general questions. For more specific coverage, see Table of Contents.

Stroev, A.S., Ye.S. Ovshepyan, and A.M. Ivanov. Arc Melting of Molybdenum in Vacuum 470

The high degree of purity necessary for satisfactory production of molybdenum can be obtained in electric arc furnaces only with high vacuum of the order of 10^{-3} mm Hg and with proper decarburization. Ingots weighing up to 15 kg. made under these conditions, are free of defects in the central zone. With respect to the rate of cooling after melting, because of the relatively fine grain structure and the distinctness of the grain boundaries, such ingots can be deformed by any method including hammer forging provided proper cooling and reduction conditions are adhered to. The deformed molybdenum exhibits satisfactory ductility characteristics at room temperature.

Pogel, A.A. Nonreducible Melting by the Induction-Heating Method 478

Berestin, A.B., and Yu.P. Stepanov. Production of High-purity Aluminum by Zonal Melting 489
The method, based on the separation of elements during crystallization, makes it possible to obtain aluminum 99.9999 percent pure, but is at present very costly and time consuming.

Paton, B.Ye.; B.I. Medvedev, V.Ye. Paton, Yu.V. Latash. New Method for "Electrical Casting" of Ingots 495
The ingot is formed of metal from one or more melting electrodes.
Card 14/32

Fogel, A.A.

YEVANGULOVA, Yevgeniya Pavlovna; FOGEL', A.A., kandidat tekhnicheskikh nauk, redaktor; SPITSYN, M.A., kandidat tekhnicheskikh nauk, redaktor; SLUKHOTSKIY, A.Ye., kandidat tekhnicheskikh nauk, redaktor; GLUKHANOV, N.P., kandidat tekhnicheskikh nauk, redaktor; RAMONER, A.V., inzhener, redaktor; SIMONOVSKIY, N.Z., redaktor izdatel'stva; MIKHAYLOV-MIKHEYEV, P.B., doktor tekhnicheskikh nauk, retsentsent; SYCHEVA, O.V., tekhnicheskiiy redaktor.

[Quality control of surface hardening] Kontrol' kachestva pe-verkhnostnoi sakalki, Izd. 2-ee, ispr. 1 dop. Pod.red. A.A. Fegelia. Moskva, Gos.nauchno-tekhn.izd-vo mashinostroit. lit-ry, 1957. 33 p. (Bibliotekha vysokoschastotnika-termista, no5] (Metals--Hardening) (Quality control) (MLRA 10:6)

1-00E L. H. H.
GOLOVIN, Georgiy Fedorovich, ; ~~FOGEL~~, A.A., kandidat, tekhnicheskikh nauk,
redaktor; SIMONOVSKIY, N.Z., redaktor izdatel'stva; SYCHEVA, O.V.,
tekhnicheskiiy redaktor.

[Structure and characteristics of elements tempered for use in high
frequency heating] Struktura i svoistva izdelii, zakalennykh pri
vysokochastotnom nagreve. Izd. 2-oe, ispr. i dop. Pod red. A.A. Fogelia.
Moskva, Gos. nauchno-tekhn. izd-vo mashinostroit. lit-ry, 1957, 45 p.
(Bibliotekha vysokochastotnika-termista, no. 4). (MIRA 10:5)
(Induktion heating) (Steel--Heat treatment)

FOGEL', A.A.,
RYSKIN, Solomon Yefimovich: FOGEL', A.A., kandidat tekhnicheskikh nauk, redaktor; SPITSYN, M.A., kandidat tekhnicheskikh nauk, redaktor; SLUKHOTSKIY, A.Ye., kandidat tekhnicheskikh nauk, redaktor; GLUKHAL'NOV, N.P., kandidat tekhnicheskikh nauk, redaktor; BAMYNER, A.B., inzhener, redaktor; SIMONC'SKIY, N.Z., redaktor izdatel'stva; DONSKOY, A.V., professor, doktor tekhnicheskikh nauk, retsenzent; SYCHEVA, O.V., tekhnicheskij redaktor

[Hardening machines] Zakalochnye stanki. Izd. 2-oe, ispr. i dop. Pod red. A.A.Fogelia. Moskva, Gos.nauchno-tekhn. izd-vo mashinostroit. lit-ry, 1957. 46 p. (Biblioteka vysokochastotnika-termista, no.11)

(Induction heating) (Metals--Hardening)

10000 5/5
ZHEZHERIN, Rostislav Petrovich; SPITSYN, Mikhail Aleksandrovich, kandidat
tekhnicheskikh nauk; FOGEL', A.A., kandidat tekhnicheskikh nauk, re-
daktor; SLUKHOTSKIY, A.Ye., kandidat tekhnicheskikh nauk, redaktor;
GLUKHANOV, N.P., kandidat tekhnicheskikh nauk, redaktor; RAMUNER, A.V.,
inzhener, redaktor; SIMONOVSKIY, N.Z., redaktor izdatel'stva; DONSKOY,
A.V., professor, doktor tekhnicheskikh nauk, retsenzent; SYCHEVA, O.V.,
tekhnicheskiiy redaktor.

[Power generators for high-frequency heating] Mashinnye generatory
dlya vysokochastotnogo nagreva, Izd. 2-oe, ispr. 1 dop. Pod red. A.A.
Fogelia, Moskva, Gos.nauchno-tekhn.izd-vo mashinostroit.lit-ry,
1957. 49 p. (Biblioteka vysokochastotnika-termista, no.8)

(MLRA 10:6)

(Induction heating) (Electric generators)

FOGEL', A.A.

PHASE I BOOK EXPLOITATION

318

Demichev, Aleksey Dmitriyevich and Shashkin, Semen Vasil'yevich

Vysokochastotnaya zakalka (High-frequency Case Hardening) 2nd ed., rev. and enl.
Moscow, Mashgiz, 1957. 52 p. (Bibliotekha vysokochastotnika-termista.
Vyp. 3) 10,000 copies printed.

Ed.: (Title page): Fogel', A.A., Candidate of Tech. Sciences; Reviewer:
Donskoy, A.V., Dr. of Tech. Sciences, Prof.; Ed. of Publishing House:
Gofman, Ye. K.; Tech. Ed.: Speranskaya, O.V.; Editorial board of series:
Fogel', A.A., Candidate of Tech. Sciences (Chairman); Spitsyn, M.A.,
Candidate of Tech. Sciences, Slukhotskiy, A.Ye., Candidate of Tech. Sciences,
Glukhanov, N.P., Candidate of Tech. Sciences (Ed. of this issue); and Baumer,
A.V., Engineer. Chief Ed. of the Leningrad Division of Mashgiz: Bol'shakov,
S.A., Engineer.

PURPOSE: This booklet is one of a series published for the purpose of promoting
high-frequency case hardening/pooling advanced production "know-how". It
is intended for a large circle of industrial workers interested in the
techniques of high-frequency case hardening.

COVERAGE: The authors give general descriptions of high-frequency devices for
induction case hardening of steel and cast-iron products. They discuss
the problem of selecting proper frequencies to be used in case hardening of

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High-frequency Case Hardening (Cont.)

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various surfaces of various shapes. There are 11 references, all USSR.

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Method of induction hardening

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Hardening of complex shapes by a two-frequency method

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May 23, 1958

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Fogel, A. A.

SHEKALOV, Aleksandr Alekseyevich; SHTREYS, Yakov Iosifovich; BLINOV, Boris Vladimirovich; DOMSKOY, A.V., professor, doktor tekhnicheskikh nauk, rezensent; FOGEL', A.A., kandidat tekhnicheskoy nauk, redaktor; SPITSYN, M.A., kandidat tekhnicheskikh nauk, redaktor; SLUKHOTSKIY, A.Ye., kandidat tekhnicheskikh nauk, redaktor; GLUKHANOV, N.P., kandidat tekhnicheskikh nauk, redaktor; BAMUNER, A.V., inzhener, redaktor; SIMONOVSKIY, N.Z., redaktor izdatel'stva; SYCHEVA, O.V., tekhnicheskoy redaktor

[Smelting in small coreless induction furnaces] Plavka v malyykh besserdchnikovykh induktsionnykh pechakh. Izd. 2-oe, ispr. i dop. Pod red. A.A.Fogel'sa. Moskva, Uss. nauchno-tekhn.izd-vo mashinostroit.lit-ry, 1957. 53 p. (Biblioteka vysokochastotnika-termista, no.14)

(Electric furnaces)

(MLRA 10:7)

SUDAKOV, P.M.; DOMSKOY, A.V., prof., doktor tekhn.nauk, retsenzent; FOGEL'
A.A., kand.tekhn.nauk, red.; SPITSYN, M.A., kand.tekhn.nauk, red.;
SLUKHOTSKIY, A.Ye., kand.tekhn.nauk, red.; GLUKHANOV, N.P., kand.
tekhn.nauk, red. BAMUNER, A.V., inzh., red.; SPERANSKAYA, O.V.,
tekhn.red.

[Instruments and measuring in high-frequency heating] Pribory i
izmereniia pri vysokochastotnom nagreve. Pod red. A.A.Fogelia.
Moskva, Gos.nauchno-tekhn.izd-vo mashinostroit. lit-ry, 1957.
54 p. (Biblioteka vysokochastotnika-termista, no.16) (MIRA 11:2)
(Electric heating--Measurement)
(Electric meters)

SLUKHOTSKIY, Aleksandr Yevgen'yevich, kandidat tekhnicheskikh nauk; ~~FOGEL',~~
~~A.A.~~ kandidat tekhnicheskikh nauk, redaktor; SPITSYN, M.A., kandidat
tekhnicheskikh nauk, redaktor; GLUKHANOV, N.P., kandidat tekhnicheskikh
nauk, redaktor; BAMUNER, A.B., inzhener, redaktor; VASIL'YEVA, V.I.,
redaktor izdatel'stva; DONSKOY, A.V., professor, doktor tekhnicheskikh
nauk, redaktor; SYCHEVA, O.V., tekhnicheskii redaktor.

[Inductors used in steel hardening] Zakalochnye induktory. Izd.2-ee,
ispr. 1 dop. Pod. red. A.A. Fogelia. Moskva, Gos.nauchno-tekhn. izd-
vo mashinostroit.lit-ry, 1957. 54 p. (Biblioteka vysochastetnika-
termista, no.6) (MLRA 10:6)

(Induction heating) (Steel--Hardening)

100-11, A.A.
SHAMOV, Aleksandr Nikolayevich; FOGEL', A.A. kandidat tekhnicheskikh nauk, redaktor; SPITSYN, M.S., kandidat tekhnicheskikh nauk, redaktor; SLEKHOTSKIY, A.Ye., kandidat tekhnicheskikh nauk, redaktor; GLUKHANOV, N.P., kandidat tekhnicheskikh nauk, redaktor; BANUMER, A.V., inzhener, redaktor; SIMONOVSKIY, N.Z., redaktor izdatel'stva; DONSKOY, A.V., professor, doktor tekhnicheskikh nauk, retsenzent; SYCHEVA, O.V., tekhnicheskij redaktor.

[Current supply of high-frequency heating installations by power generators] Pitanie vysokochastotnykh nagrevatel'nykh ustroystv ot mashinnykh generatorov, Izd.2-ee, ispr. 1 dop. Pod red. A.A. Fogelia. Moskva, Gos.nauchno-tekhn.izd-vo mashinestroit. lit-ry, 1957. 55 p. (Bibliotekha vysokochastotnika-termista, no.10)
(MLRA 10:6)

(Induction heating)

GLUKHANOV, Nikolay Parmenovich , ; FOGEL', A.A., kandidat tekhnicheskikh nauk, redaktor; SPITSYN, M.A., kandidat tekhnicheskikh nauk, redaktor; SLUKHOTSKIY, A.Ye., kandidat tekhnicheskikh nauk, redaktor; BAMYNER, A.V., inzhener, redaktor; SIMONOVSKIY, N.Z., redaktor izdatel'stva; SYCHEVA, O.V., tekhnicheskii redaktor.

[Physical basis of high frequency heating] Fizicheskie osnovy vysokochastotnogo nagreva, Izd.2-oe, ispr.1 dorp. Pod red. A.A. Fogelia. Moskva, Gos.nauchno-tekhn.izd-vo mashinostroit.lit-ry, 1957. 58 p. (Biblioteka vysokochastotnika-termista, no.2) (MIRA 10:5)
(Induction heating)

FOGEL, Aleksandr Aleksandrovich, kandidat tekhnicheskikh nauk, SPITSYN, M.A., kandidat tekhnicheskikh nauk, redaktor; SLUKHOTSKIY, A.Ye., kandidat tekhnicheskikh nauk, redaktor; GLUKHANOV, kandidat tekhnicheskikh nauk, redaktor; RAMUNER, A.B., inzhener, redaktor; SIMONOVSKIY, N.Z., redaktor izdatel'stva; SYCHEVA, O.V., tekhnicheskiiy redaktor.

[Industrial application of high-frequency currents] Promyshlennoe primeneniye tekov vysokoi chastoty. Izd. 2-oe, ispr. i dop. Moskva, Gos. nauchno-tekhn. izd-vo mashinostroit. lit-ry, 1957. 58 p. (Biblioteka vysokochastotnaya-termista, no. 1) (MLRA 10:6)
(Induction heating)

Fogel, A.A.

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Vasil'yev, Aleksandr Sergeyevich.

Lampovyye generatory dlya vysokochastotnogo nagreva (Vacuum-tube Oscillators for High-frequency Heating) Moscow, Mashgiz, 1957.
60 p. (Bibliotekha vysokochastotnika-termista, vyp. 9) 10,000 copies printed.

Ed.: (title page): Fogel', A.A., Candidate of Technical Sciences;
Reviewer: Donskoy, A.V., Doctor of Technical Sciences, Professor;
Ed. of Publishing House: Gofman, Ye.K.; Tech. Ed.: Speranskaya, O.V.
Editorial board of series: Fogel', A.A. (Chairman); Spitsyn, M.A.
Candidate of Technical Sciences (Ed. of this issue); Slukhotskiy, A.Ye.,
Candidate of Technical Sciences; Glukhanov, N.P., Candidate of Technical Sciences, and Bamuner, A.V., Engineer.

PURPOSE: This monograph, one of a series of booklets published under the general title "Bibliotekha vysokochastotnika-termista" is addressed to a wide circle of workers in industry who are interested in high-frequency heating technique and equipment. The series is intended to encourage the widespread introduction of high-frequency heating, and the exchange of the latest production experience.

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Vacuum-tube Oscillators for High-frequency Heating (Cont.) 353

COVERAGE: This booklet is concerned with one phase of high-frequency heating technique, i.e., vacuum-tube oscillators for high-frequency heating. The series "Bibliotekha vysokochastotnika-termista" is devoted to publicizing the latest developments in the field of high-frequency heating, and the results of experimental work carried on by the Institute of High-Frequency Currents imeni V.P. Vologdin. Other work being carried on in this field in the Soviet Union and in the non-Soviet world is also covered. This booklet discusses the general principles for the design of vacuum-tube oscillators, and the function of the individual units. Commercial types of oscillators are described, and the problems of adjusting and tuning the units are discussed as well as the future development of vacuum-tube oscillators. This type of apparatus is important in many branches of industry where 100 kc/s currents are employed in dielectric and induction heating. In the USSR, all oscillators for this purpose are of the self-excitation type inasmuch as frequency stability is not important in the high-frequency heating of metals and semiconductors. The equipment is produced at the Leningrad

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Vacuum-tube Oscillators for High-frequency Heating (Cont.) 353

High-Frequency Equipment Plant. Included in the discussion of the development of vacuum-tube oscillators is a description of a new type of oscillator, the electron-tube inverter, with which it is possible to generate high-efficiency currents of various frequencies. Various types of equipment of Soviet manufacture are described and a table of specifications is presented (pp 48, 49). No personalities are mentioned. A complete list of all the booklets of the series is given at the end of each issue (on inside back cover). There is a bibliography of 4 Soviet sources.

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AVAILABLE: Library of Congress

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June 4, 1958

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FOGEL, M.A.

BRITSYN, N.I.; DONSKOY, A.V., prof., doktor tekhn.nauk, retsenzent; FOGEL',
A.A., kand.tekhn.nauk, red.; SPITSYN, M.A., kand.tekhn.nauk, red.;
SLUKHOTSIIY, A.Ye., kand.tekhn.nauk, red.; GLUKHANOV, N.P., kand.
tekhn.nauk, red.; BAMUNER, A.V., inzh., red.; GOFMAN, Ye.K., red.
izd-va; SPERANSKAYA, O.V., tekhn.red.

[High-frequency electric field heat treatment] Nagrev v elektriche-
skom pole vysokoi chastoty. Izd. 2-oe, ispr. i dop. Pod red. A.A.
Fogelia. Moskva, Gos.nauchno-tekhn.isd-vo mashinostroit. lit-ry,
1957. 62 p. (Bibliotekha vysokochastotnika-termista, no.15)
(Dielectric) (MIRA 11:2)
(Lumber--Drying)

FOGEL', A. A.

VOLOGDIN, Vladislav Valentinovich; FOGEL', A. A., kandidat tekhnicheskikh nauk, redaktor; SPITSYN, M. K., kandidat tekhnicheskikh nauk, redaktor; SLUKHOTSKIY, A. Ye., kandidat tekhnicheskikh nauk, redaktor; GLUKHANOV, N. P., kandidat tekhnicheskikh nauk, redaktor; BAMUNER, A. V. inzhener, redaktor; SIMONOVSKIY, N. Z., redaktor izdatel'stva; KHORO-SHAYLOV, V. G., kandidat tekhnicheskikh nauk, retsenzent; SYCHEVA, O. V. tekhnicheskiiy redaktor.

[Induction soldering]. Piska pri industriennom nagreve. Izd. 2-oe, ispr. 1 dep. Fed. red. A. A. Fogelia. Moskva, Gos. nauchno-tekhn. ind-ve mashinostroit. lit-ry, 1957. 66 p. (MLRA 10:6)
(Induction heating) (Solder and soldering)

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BOGDANOV, Valentin Nikolayevich; FOGEL', A.A., kandidat tekhnicheskikh nauk, redaktor; SPITSYN, M.A., kandidat tekhnicheskikh nauk, redaktor; SLUKHOTSKIY, A.Ye., kandidat tekhnicheskikh nauk, redaktor; GLUKHANOV, G.P., kandidat tekhnicheskikh nauk, redaktor; BAMUNER, A.V., inzhener, redaktor; VASIL'YEVA, V.P., redaktor izdatel'stva; DONSKOY, A.V., professor, doktor tekhnicheskikh nauk, retsentsent; SYCHEVA, O.V., tekhnicheskiy redaktor.

[Use of through induction heating in industry] Primenenie skvoznoy induktsionnoy nagreva v promyshlennosti. Izd. 2-oe, ispr. 1 dop. Pod red. A.A. Fogelia. Moskva, Gos. nauchno-tekhn. izd-vo mashinostroyt. lit-ry, 1957. 78 p. (Biblioteka vysokochastotnaya-termista, no. 12)
(MLRA 10:6)

(Induction heating)
(Metals--Heat treatment)

7-2005 IN, Vsevolod Valentinovich; SLUKHOTSKIY, Aleksandr Yevgen'yevich;
 DONSKOY, A.V., professor, doktor tekhnicheskikh nauk, korespondent;
 FOGELL, A.A., kandidat tekhnicheskikh nauk, redaktor; SPITSYN, I.A.,
 kandidat tekhnicheskikh nauk, redaktor; SLUKHOTSKIY, A.Ye., kandi-
 dat tekhnicheskikh nauk, redaktor; GLUKHALOV, N.P., kandidat tekhn-
 icheskikh nauk, redaktor; BAMUNER, A.V., inzhener, redaktor;
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[Transformers for high-frequency heating] Transformatory dlia
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 nauchno-tekhn.izd-vo mashinostroit. lit-ry, 1957. 79 s. (Biblioteka
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 (Induction heating) (Electric transformers)

8(4)

SOV/112-59-4-7271

Translation from: Referativnyy zhurnal. Elektrotehnika, 1959, Nr 4,
pp 117-118 (USSR)

AUTHOR: Fogel', A. A.

TITLE: Non-Crucible Melting by Induction Heating

PERIODICAL: V sb.: Prom. primeneniye tokov vysokoy chastoty. Riga, 1957,
pp 19-30

ABSTRACT: Equipment for induction melting of metal held in suspension by an inductor field is described. It is noted that melting furnaces of 1-50-cm diameter operate with a capacity of $5 \times 10^{-1} - 10^{-2}$ kw/cm³. Calculated curves are presented that show the possibility of raising the per-unit capacity, for the same furnace diameter, to $10 - 10^{-2}$ (?) kw/cm³. Equipment for producing an ingot in a copper crystallizer that melts the cylindrical billets in vacuum and a vacuum equipment for melting the metal in a crucible which is made from a compacted powder of the same metal are described. An experiment with a

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Non-Crucible Melting by Induction Heating

metal water-cooled funnel is displayed; the funnel with a load suspended from it is held in suspension in an electromagnetic field; the magnet is supplied by a 2,500-cps oscillator. The power supplied to the funnel is 1.7 kw. During the melting of aluminum by a single-turn inductor placed over the metal surface, the molten metal, in the copper water-cooled crystallizer, formed a column a few cm high in the center of the inductor. Aluminum melting within a slag lining was accompanied by a displacement of the metal in the inductor center and around the outer edge. These forces of metal-inductor interaction were used for driving the liquid metal from the melting zone into the mold. A higher metal-inductor electromagnetic coupling tends to raise the efficiency of energy transmission from inductor to metal. It is stated that an inductor comprising 2 opposing turns can ensure the stable position of a piece of metal in a free suspension. A 2-turn inductor, in which one turn is fed at 2-8 kc for maintaining the suspended state of the piece, while the second is fed by a higher

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Non-Crucible Melting by Induction Heating

frequency for melting, is recommended as the most expedient design. Such an inductor can serve also for eliminating the metal throw-off if the inductor is fed from one low-frequency generator or from two generators of different frequencies. By varying the field intensity or the field frequency, the diameter of the metal stream flowing through the inductor can be varied 1:10. The stream diameter can be reduced down to approximately twice the depth of current penetration into the molten metal. To make possible the use of larger-diameter billets, the property of a metal bar to form "reefs" on its surface when melting in a strong electromagnetic field can be used. The "reef" pitch depends on the strength and frequency of the field. Grooves with a pitch shorter than two current-penetration depths can be milled on the billet; then the "reefs" resting on the solid parts of metal, on both sides of the molten zone, will not be heated; the molten bar core will not flow out through the narrow slits between the reefs because of surface-tension forces. By heating

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Non-Crucible Melting by Induction Heating

the metal in tone-frequency fields, discharges were eliminated when manganese and chromium were melted in vacuum with a vapor pressure of 1 mm (mercury column) at the melting point. Rut's pump is recommended for maintaining the high vacuum required. Satisfactory results were also obtained with absorbing gases by a degassed activated carbon cooled by liquid nitrogen.
13 illustrations.

I. L. K.

Card 4/4

FOGEL, A. A.

Leningrad Branch of Baykov, Institute

"Crucibleless Melting in Vacuum or in the Protective Atmosphere in Laboratory Scale."

paper presented at Second Symposium on the Application of Vacuum Metallurgy.

1-6 July 1958, Moscow

AUTHOR: Fogel', A.A. (Leningrad) SOV/180-59-2-5/34
TITLE: Fusion of Laboratory Samples in a Vacuum or Inert-Gas Atmosphere Without a Crucible (Bestigel'naya plavka laboratornykh obraztsov v vakuumе ili atmosfere inertnogo gaza)
PERIODICAL: Izvestiya Akademii Nauk SSSR, Otdeleniye tekhnicheskikh nauk, Metallurgiya i Toplivo, 1959, Nr 2, pp 24-34 (USSR)
ABSTRACT: The author describes a number of methods and equipment suitable for fusion of reactive metals without contamination. Advances in this field have been made by the laboratoriya vysokochastotnoy elektrotermii (high-frequency electro-thermics laboratory) of the Institut Metallurgii imeni A.A. Baykova AN SSSR (Institute of Metallurgy of the AS USSR im. Baykov) together with the Institut tokov vysokoy chastoty imeni V.P. Vologdina (High-frequency currents institute imeni Vologdin). The author deals first with levitation, discussing the metal weight which can be dealt with. He shows that, with the "spoon" inductor developed (Figs 1 and 2), the heat input to the metal is not related simply to power input. Since
Card 1/3 pumping time for vacuum melting greatly exceeds melting

SOV/180-59-2-5/34

Fusion of Laboratory Samples in a Vacuum or Inert-Gas Atmosphere
Without a Crucible

time (a few minutes), arrangements are provided for successive melting of several charges without breaking the vacuum (Fig 3). Fig 4 shows some titanium ingots obtained. Activated charcoal, cooled indirectly with liquid nitrogen, is located close to the molten metal (Fig 5) to help the maintenance of the highest vacuum (or gas purely with inert-gas atmospheres). An absorber (Fig 7) filled with activated charcoal (GOST 6217 - 52) and type KSM silica gel (GOST 3956-54) is also provided. A simpler design of absorber can be used (Fig 8) if all-metal construction is not required. To increase the weight of metal that can be melted several spheres can be fused simultaneously in a zigzag or "boat" shape of inductor (Fig 11). With modifications the same fusion chamber can be used for melting in a water-cooled copper crucibles; up to 100 g of metal can be melted simultaneously. On fusion the metal is squeezed from under the inductor by the action of the electromagnetic field and forms a high and mobile meniscus (Fig 12); on switching off, the metal solidifies in the form of a

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Fusion of Laboratory Samples in a Vacuum or Inert-Gas Atmosphere
Without a Crucible

pancake (Fig 13 shows some titanium-alloy pancake ingots drilled for sampling). In the same apparatus bars of compressed powder or gramules can be melted over the mould, into which the metal drips to form an ingot. Fig 14 shows the arrangement and Fig 15 its application to titanium.

Card 3/3 There are 16 figures and 4 references, of which 3 are English and 1 Soviet.

ASSOCIATION: Institut Metallurgii AN SSSR (Institute of Metallurgy, AS USSR)

SUBMITTED: June 27, 1958

PART 1 BOOK EXTRACTATION		807/1545
Abdumalyk mat. 5358. Emulsion for fibro-thaliodendritic osseous proliferative fibell		
Primeneniye vnutrennykh yuzhnykh (Use of vacuum in Metallurgy) Kozlov, Iad-ro		
AM 5358, 1950. 224 p. Krasnaya slava. Issledovaniye. 4,500 copies printed.		
Spetsializatsionnyy agent. Abdumalyk mat. 5358. Isolated metallurgical liquid A.A. Baykova.		
Emulsion for fibro-thaliodendritic osseous proliferative fibell.		
Baykov, M.I. A.A. Smektita, Corresponding Member, Academy of Sciences USSR, Ed. of		
Publications Moscow: G.K. Izdatel'stvo; Tech. Ed., 5.0. Moscow.		
PREFACE: This collection of articles is intended for technical personnel interested		
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CONTENTS: The book contains information on steel making in vacuum induction fur-		
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S/110/60/000/004/001/005
E073/E535

AUTHOR: Fogel', A.A., Candidate of Technical Sciences

TITLE: Induction Methods of Melting Metals Without a Crucible
(Levitation Melting)

PERIODICAL: Vestnik elektropromyshlennosti, 1960, No.4, pp.16-20

TEXT: Levitation melting of small quantities of metals by induction heating enables conserving the original purity of the metals and carrying out the melting process in an atmosphere of inert gases and in deep vacuum. The Laboratoriya vysokochastotnoy elektrotermii, Institut metallurgii imeni A. A. Baykova AN SSSR (High-Frequency Electrothermal Laboratory of the Metallurgical Institute imeni A. A. Baykov) jointly with the Institut tokov vysokoy chastoty imeni Prof. V. P. Vologdina (High-Frequency Current Institute imeni Professor V. P. Vologdin) developed universal equipment enabling the melting of chemically active metals by induction heating using three methods: the metal is suspended freely in the magnetic field of the inductor; the metal is in a water-cooled copper crucible; a metallic rod is melted above an ingot mould. Depending on the method used, the equipment enables melting 10, 100 and 1000 g of metal, respectively. All the
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**Induction Methods of Melting Metals Without a Crucible
(Levitation Melting)**

methods of levitation induction melting involve high heat losses and, therefore, much greater (up to ten times) power is required than for ordinary induction furnaces. The magnetic field generates considerable forces which act on the metal. As long as the metal is solid, some of these forces are mutually equalized, the rest equalize the weight of the heated metal and as a result it will remain suspended in the inductor field when not otherwise supported. About 10 to 15 g of metal can be held suspended in the molten state. Photographs of a few types of inductors are included and the flow conditions of the molten material are discussed. One of the most reliable types is the "boat" inductor, Fig.5. In this, the blank is held above the inductor by means of a low-frequency magnetic field and the material is made to melt off by using a high-frequency field. The configuration of the magnetic field of the "boat" inductor is shown in Fig.6. The minimum potential field is located between the two top conductors which encircle the metal suspended in the field. A disadvantage of the "boat" inductor is that high temperatures cannot be obtained at frequencies

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Induction Methods of Melting Metals Without a Crucible
(Levitation Melting)

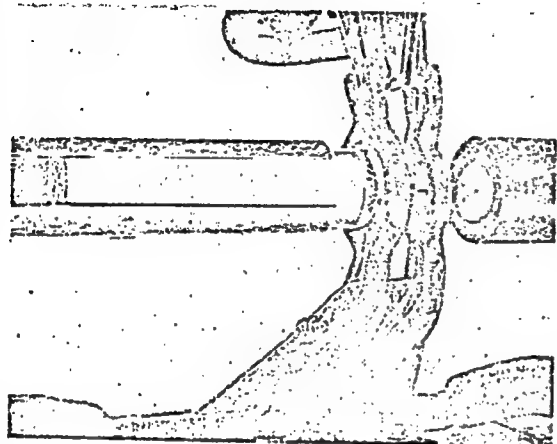
which are usual for industrial tube oscillators produced for smelting and heating metals. This drawback can be eliminated by using an inductor with a reverse turn consisting of two turns which are wound in mutually opposite directions (Fig.8); the configuration of the magnetic field of the latter is shown in Fig.7. For melting metal in quantities of 10 to 15 g in the suspended state, oscillators of the frequencies 70 to 400 kc/s are suitable. The designs described in the paper enable melting almost any metal by means of a 200 kc/s tube oscillator. "Boat" inductors enable melting metals with fusion points below 2000°C and inductors with a reverse winding enable melting metals with fusion points below 3000°C. For studying the kinetics of interaction between metals and gases, the metal can be enclosed in a quartz ampoule placed inside the inductor; multi-turn inductors can be used, although the larger voltages involved are undesirable in the given case. There are 8 figures and 5 references: 2 Soviet and 3 non-Soviet. X

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Induction Methods of Melting Metals Without a Crucible
(Levitation Melting)

Fig.5



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Рис. 5. Заготовка, удерживаемая над индуктором магнитным полем низкой частоты, оплавляется магнитным полем высокой частоты.

Fig.6

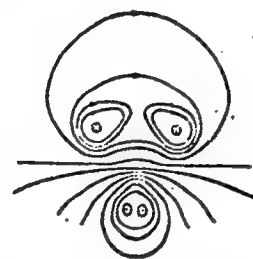


Рис. 6. Конфигурация магнитного поля индуктора «лодочка».

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Induction Methods of Melting Metals Without a Crucible
(Levitation Melting)

Fig.7

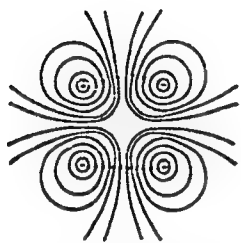


Рис. 7. Конфигурация
магнитного поля индук-
тора с обратным витком.

Fig.8

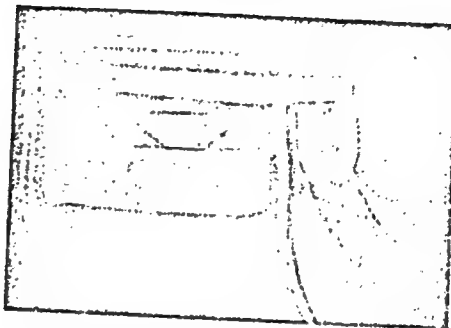


Рис. 8. Вытеснение жидкого алюминия в поле
индуктора с обратным витком.

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SOV 80-33-2-11, 52

AUTHORS: Ageyev, N. V., Fogel', A. A., Siderova, T. A., Trapeznikov, V. A.

TITLE: Melting Chromium in a Suspended State

PERIODICAL: Zhurnal prikladnoy khimii, 1960, Vol 33, Nr 2, pp 332-337 (USSR)

ABSTRACT: The use of chromium as a base for heat-resistant alloys presents difficulties due to the brittleness of this metal caused by various impurities. One of the authors (A. A. Fogel, Izv. AN SSSR, OTN, 1959, Vol 2, p 24: Experimental Technique and Methods of Investigation at High Temperatures (Eksperimental'naya tekhnika i metody issledovaniy pri vysokikh temperaturakh) publ. by AN SSSR, 1959, p 478) developed a method of melting chromium which dispensed with the use of a crucible and avoided in this manner the contamination of the metal with mineral and gaseous impurities. The metal was kept suspended in an electromagnetic field, and melted by induction heating

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Melting Chromium in a Suspended State

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in purified helium atmosphere. The melting apparatus was fed by a standard electronic generator type WGPZ-60 with a frequency of 200,000 hertz. The initial vacuum in the melting chamber before the introduction of helium was from $3 \cdot 10^{-3}$ to $5 \cdot 10^{-6}$ mm Hg, depending on the conditions of the experiment. To avoid volatilization of the metal, the melting was made under 1.1-1.2 atm helium pressure. The gas was carefully purified by passing it through a adsorbing filter filled with activated carbon and silica gel, cooled down to the boiling point of liquid nitrogen. Chromium samples were prepared from electrolytically refined metal, or from metal purified by means of the iodine method, designated in this abstract as "iodide chromium." Little spheres (d - about 16 mm; weight, 12-15 g) were compressed from the above materials and degassed before melting by slow heating in high vacuum (about 10^{-6} mm Hg). The metal was maintained suspended in the magnetic field until fully molten; when the field was switched

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Melting Chromium in a Suspended State

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off, the metal dropped into a copper casting mold. From 100 cast samples, 25% showed a lower content of nitrogen as compared with the initial content, 73% showed no changes, and 2% showed a higher than initial nitrogen content. The electrolytic chromium used in the experiments contained: O, 0.0084-0.013%; N, 0.008-0.0108%; H, about 0.001%; C, 0.020-0.025%; S, 0.003-0.004%; Si, 0.040%; Fe, 0.030%; Al, 0.01-0.015%; Mn, 0.003%; Ni, 0.0007%; Cu, 0.001-0.004%; Ti, 0.006%; Co, 0.001%. The compressed spheres showed 0.0103-0.0122% oxygen on the surface, and 0.0082-0.0092% near the center; nitrogen content was respectively 0.012% and 0.0073%. The melting took 105 sec, and the O and N content inside the cast samples was, respectively, 0.0068-0.0110%, and 0.0030-0.0069%, i.e., the O and N content did not increase during the melting and casting. Similar results were obtained with the iodide chromium (about 0.005% oxygen, and about 0.006% nitrogen inside the cast samples). Hardness of the cast samples

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Melting Chromium in a Suspended State

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(Rockwell scale B converted to Brinell) was 115-116 kg/mm² for the electrolytic, and 108-110 kg/mm² for the iodide chromium. Tensile strain of the electrolytic chromium castings was determined in an IM-4P type machine in the range of 45-400° C. The yield point was reached above 250° C, but even at 450° C the tensile strain was only 3%. Compression tests showed that the point of transition from plastic to brittle state (at 150-175° C) was identical for both the electrolytic and the iodide chromium casts. There are 5 figures; and 5 Soviet references.

ASSOCIATION: A. A. Baykov Institute of metallurgy, Academy of Sciences USSR (Institut metallurgii imeni A. A. Baykova AN SSSR)

SUBMITTED: June 6, 1959

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E194/E555

AUTHORS: Fogel', A.A., Pavlov, N.A., Korokin, I.V. and Sidorova, T.A. (Leningrad)

TITLE: Inductors for heating and melting metals in the levitated condition

PERIODICAL: Akademiya nauk SSSR. Izvestiya. Otdeleniye tekhnicheskikh nauk. Metallurgiya i toplivo, no.5, 1961, 51-61

TEXT: The practice of heating levitated metals suspended freely in an electromagnetic field is increasing, but many practical problems remain unsolved. This article considers the influence of the frequency and configuration of the electromagnetic field on the heating of a metallic body suspended in it. Expressions are written for the relationship between the electromagnetic pressure on the levitated metal and the specific power transmitted to it. The formulae show that by altering the frequency and intensity of the magnetic field the electromagnetic pressure on the metal may be changed without altering the power transmitted to it. In the case of a freely-suspended metallic body, the force applied by the field is equal to the weight of the body.

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Inductors for heating and melting ... ³⁰⁸⁹⁶
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Thus, by altering the frequency it is possible to regulate the power transmitted to the metal and so its temperature. The effect is not strictly a surface one, as the metal has some 'transparency' to the field. Elementary consideration is therefore given to the case of induction heating of a metal plate in a longitudinal plane parallel magnetic field. Formulae are derived for the power transmitted per unit surface of plate, for the electromagnetic pressure on the plate and for the ratio of pressure to power. These expressions are used to construct the curves shown in Fig.1 in which the power transmitted to the plate (curve 1), the electric field strength (curve 2) and the magnetic field strength (curve 3) are plotted as functions of field frequency with a constant electromagnetic pressure on the plate surface ($F = \text{const}$) and constant plate thickness ($d = \text{const}$). The depth of penetration of the electromagnetic energy $\Delta = \sqrt{\rho/\pi \mu f}$ For a levitated

body the necessary electromagnetic force is determined by its weight. The power required for heating depends mainly on the temperature required because, as there is no thermal insulation, thermal equilibrium is established very quickly, within two or three minutes. The graph of Fig.1 shows that for a given body

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with constant electromagnetic pressure applied to it the power increases with the frequency, so that to raise the temperature the frequency should be raised. The limiting frequency depends on the maximum permissible electrical field intensity at the body surface or on the associated voltage on the inductor. The maximum permissible electrical field intensity should be less than that which causes electrical breakdown and this depends on the properties of the gaseous medium surrounding the inductor. If, with constant electromagnetic pressure, the frequency is reduced then the magnetic field strength must be increased; that is to say, the inductor current must be increased. The limit in this case depends on the permissible current density in the inductor conductors. Thus for a metal body of given size there is a definite range of frequency within which the body can be suspended in the electromagnetic field. The choice of frequency depends on the temperature required and by altering the frequency within this range it is possible to control the limiting temperature of the metal whilst maintaining it in the levitated condition. When a fixed metal body is heated by induction there is a direct

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relationship between the power applied to the inductor and that transmitted to the body. But in the case of a body of levitated metal an allowance must be made for the configuration of the field set up by the inductor, because the configuration determines the nature of the relationship between the power applied to the inductor and that transmitted to the metal. The power transmitted to the metal body is related to the pressure applied to it by the magnetic field. Both the power and the electromagnetic pressure depend upon the magnetic field intensity at the body surface. If the body is levitated, the vertical component equals the weight of the body and the horizontal is zero. Evidently to support the weight of a freely suspended metal body the field intensity under the body should be greater than that above it. In a more uniform field a higher overall field intensity is necessary to support the body. Thus a greater power is transmitted to the body in the more uniform field. If the power applied to the inductor is altered, the position of the body may alter. If it moves vertically but without any change in the field at its surface, there will be no change in the power transmitted to the body. Whereas

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if in moving vertically it passes from a field of one configuration to that of another, then as the power applied to the inductor is increased, that transmitted to the body may increase or decrease, depending upon the configuration of the field. A brief analysis is then made of the field between the two conductors with current flowing in opposite directions. The force acts perpendicular to the direction of the magnetic field, so it is the horizontal component of the field that governs the vertical thrust that supports the body, whilst the lateral component of the field causes only a compression of the body. Thus, if the ratio of the horizontal to the vertical component is low, the plate is suspended at a lower level and a greater power is transmitted to it. Further consideration shows that, in the case of a single-loop inductor, as the power applied to the inductor is increased and the metallic body rises, the power transmitted to it first decreases and then rises again. It is important that the metallic body suspended in the field should have lateral stability, which is not achieved in the simple cases so far considered. The inductors of practical interest are those in which the metal can hang stably in the field.

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The metallic body is displaced from a region of strong field to one of weak field, or, as it were, rolls down a 'hollow' in the field. Inductors for melting levitated metals may be classified into three types according to the relationship between the power transmitted to the body and the power applied to the inductor. One type consists of two co-planar rings connected in parallel with currents flowing in opposite directions. In a particular case the rings were of 120 and 210 mm internal diameter and the suspended metal was a disc of 150 mm diameter weighing 460 g. The outer coil was used to stabilise the disc. As the disc moves vertically the field at its surface remains constant; it is horizontal at the lower surface and zero at the upper because the disc thickness is much greater than the depth of penetration of the field. Thus the power applied to the body should remain constant and this is in fact found to be the case. The second type of inductors are those shaped like a boat or cradle consisting of two vertical coils connected in parallel and shaped like a cradle. The ends of the inductor are bent vertically upwards to make the suspended cylindrical body stable in the axial direction. With an inductor of this

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type an increase in the power applied to the inductor reduces the power absorbed by the body. Only after the body has risen a considerable distance above the lower conductors is there an appreciable increase in the power intake of the metal. The third type of inductor again has two vertical loops but one is cross-connected, so that whereas in the second type the upper pair of conductors both carry current in the same direction, in this type diametrically opposite conductors carry current in the same direction. In this type of inductor the metal body undergoes symmetrical compression by the electromagnetic field. As the power applied to the inductors is increased, the field intensity at the body surface increases on all sides and so the transmitted power increases. Comparison of test results for similar specimens at a frequency of 2 500 c/s shows that for a given power applied to an inductor of this cross-connected type, the maximum power transmitted to the body is at least four times greater than that of the 'cradle' type. Thus the cross-connected type should be used to produce high temperatures. The design of inductors for melting metals in the levitated condition has special features.

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In suspending a liquid body it is necessary that the hydrostatic pressure should be equalised by the electromagnetic at every point of the surface. The weight of suspended liquid metal is limited by its surface tension and specific gravity. To increase the efficiency of the system the size of the inductor should be quite small and to avoid the liquid metal sticking to the inductor conductors the field must be symmetrical. The current-carrying leads distort this symmetry and weaken the field in places. To restore the symmetry various devices are used, such as false leads placed opposite the real ones or displacement of the centres of the upper and lower rings of the inductor, and so on. It is desirable that the bottom of the inductors should be at equal potentials, otherwise the metal at the bottom of the inductor will initially short-circuit the portions at different potential, which can cause sparking and contamination of the hot metal by copper from the inductor. A special 'boat' type of construction is used to set up an equipotential bottom. As before, increasing the power applied to the inductor reduces the power transmitted to the molten metal and this somewhat limits its field of application. X

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Inductors for heating and melting ... S/180/61/000/005/006/018
E194/E555

The boat-type inductor is very convenient for series melting but the maximum temperature of the molten metal is lower than in a cross-connected inductor. In experiments with the 'boat' construction at a frequency of 70 kc/s, the metal could be raised to a temperature of 1500°C, and at a frequency of 200 kc/s to 2000°C. Therefore, as previously mentioned, the cross-connected inductor should be used to obtain higher temperatures. Two types have been developed, one with the coils connected in parallel and the other connected in series. In neither type is it possible to develop an equipotential bottom as in the boat conductor. However, the low voltage on the lower coil and the high contact resistance between the inductor conductors and the still cold solid metal practically prevents sticking of the metal to the inductor. At the instant of switching-on, the metal jumps and hangs in the field. In the inductor with parallel-connected coils the maximum potential difference between conductors is less than in that with series coils and, therefore, the parallel construction is more reliable in operation. However, the series connection can give higher temperatures. The limiting temperature for an inductor

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30896

Inductors for heating and melting ... S/180/61/000/005/006/018
E194/E555

with parallel cross-connected coils at a frequency of 200 kc/s was 2500°C and for the series version 3000°C. This difference arises partly from heavier losses in the leads to the parallel case and partly from the higher magnetic pressure above the suspended metal body in the series case. In the latter the current is the same in both turns whereas in the parallel connection the current in the upper turn is less than that in the lower because of the difference in diameter. The following table gives data on the melting of various metals in inductors of different designs and the weight of the samples.

Metal	Density g/cm ³	Melting point, °C	Weight, g	Type of inductor
Titanium	4.5	1720	12	'Boat'
Zirconium	6.5	1850	12	"
Chromium	7.1	1890	15	"
Vanadium	6.0	1910	12	"
Rhodium	12.4	1966	10	"
Niobium	8.5	2420	10	Parallel cross-

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(Table cont. next card)

connected

Inductors for heating and melting ... 30896
S/180/61/000/005/006/018
E194/E555

Molybdenum	10.2	2630	8	Series cross-connected
Tantalum	16.6	3000	8	" " "
Tungsten	19.8	3400	xx	" " "

- * Weight of liquid metal levitated
- ** Levitated in solid condition but did not melt.

There are 8 figures, 1 table and 6 references: 4 Soviet and 2 non-Soviet. The English-language references read as follows:
Ref.5: Okress E.C., Wroughton D.W., Comenetz G., Brace P.H.,
Kelly J.C.R. Electromagnetic Levitation of solid and molten metals.
J. Appl. Phys. 1952, v.23, No.5, pp.545-552; Ref.6: Harris B. Sc.
and Jenkins A.E. Controlled atmosphere levitation system. J.Scient.
Instrum. 1959, v.36, May, pp.238-240. ✓

SUBMITTED: February 9, 1961

Card 11/11 //

GUTS, Z. A.; REYNOV, N. M.; KRIVKO, N. I.; SIDOROVA, T. A.; FOGEL', A. A.

Superconducting alloys in the system Nb - Zr. Fiz. tver. tela 5
no.1:361-362 Ja '63. (MIRA 16:1)

1. Fiziko-tehnicheskii institut imeni A. F. Ioffe AN SSSR,
Leningrad.

(Niobium-zirconium alloys) (Superconductivity)

SPITSYN, M.A.; FOGEL', A.A., kand. tekhn. nauk, red.

[Mechanical generators for induction heating] Mashinnye
generatory dlia vysokochastotnogo nagreva. Izd.3., perer.
i dop. Moskva, Mashinostroenie, 1965. 51 p.
(MIRA 18:8)

BAMUNER, A.V.; DONSKOY, A.V., doktor tekhn. nauk, prof., retsenzent;
FOGEL', A.A., kand. tekhn. nauk, red.

[Automatic control of high-frequency heating processes] Av-
tomaticheskoe regulirovanie protsessov vysokochastotnog
nagreva. Moskva, Mashinostroenie, 1965. 56 p. (Biblioteka
vysokochastotnika-termista, no.17) (MIRA 18:8)

FOGEL', A.A.; DONSKOY, A.V., prof., doktor tekhn. nauk, retsenzent

[Industrial uses of high-frequency currents] Promyshlennoe
primeneniye tokov vysokoi chastoty. Izd.3., ispr. i dop.
Moskva, Mashinostroeniye, 1965. 76 p. (Bibliotekha vysoko-
chastotnika-termista, no.1) (MIRA 18:8)

L 2559-66 EWT(1)/EWT(m)/EWP(w)/EPF(n)-2/T/EWP(t)/EWP(b)/EWA(c) IJP(c) JD/
JG/GG

ACCESSION NR: AP5024050

85
87
B
UR/0057/65/035/009/1675/1677

AUTHOR: Guts, Z. A.; Krivko, N. I.; Morozova, V. K.; Sidorova, T. A.; Fogel', A. A.

TITLE: Superconducting alloy in the Nb-Ga system

SOURCE: Zhurnal tekhnicheskoy fiziki, v. 35, no. 9, 1965, 1675-1677

TOPIC TAGS: superconductivity, superconducting alloy, niobium, gallium

ABSTRACT: Results are presented of measurements of the superconducting properties of alloys in a Nb-Ga system at a temperature of 4.2K and magnetic fields up to 28 koe. The alloys were prepared by means of special equipment developed by the FTI Laboratory and described elsewhere (I. V. Korkin. Promyshlennoye primeneniye tokov vysokoy chastoty, ed. G. F. Golovina, Izd. "Mashinostroyeniye," M-L, 1964, 269-275). The starting materials consisted of vacuum-refined niobium and metallic gallium. The latter was additionally degassed at 800-1000C in vacuum at 10^{-4} - $2 \cdot 10^{-5}$ mm Hg for a period of 2-3 min. The transition from the superconducting state to the normal state was recorded by a change in the inductance of a coil prepared from the given alloy. Mechanical experiments showed the highest plasticity in alloys with 7-12% Ga (by weight). Their hardness did not exceed 350 kg/mm², whereas the hardness of alloys

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L 2559-66

ACCESSION NR: AP5024050

with 12—32% Ga was 450—850 kg/mm². Alloys containing 7—12% Ga are apparently the most suitable for wires. Orig. art. has: 1 table and 1 figure. [YK]

ASSOCIATION: Fiziko-tekhnicheskiy institut im. A. F. Ioffe AN SSSR, Leningrad
(Physicotechnical Institute, AN SSSR)

SUBMITTED: 21Dec64

ENCL: 00

SUB CODE: MM, EM

NO REF SOV: 002

OTHER: 002

ATD PRESS: 4108

Card 292

GLUKHINOV, N.P.; DONSKOY, A.V., prof., doktor tekhn. nauk,
retsenzent; FOGEL', A.A., kand. tekhn. nauk, red.

[Physical principles of high frequency heating] Fizicheskie osnovy vysokochastnogo nagreva. Moskva, Mashinostroenie, 1965. 78 p. (Bibliotekha vysokochastotnikatermista, no.2) (MIRA 18:10)

GUTS, Z.A.; KRIVKO, N.I.; MOROZOVA, V.K.; SIDOROVA, T.A.; FOGEL', A.A.

Superconducting alloys in the system Nb - Ga. Zhur. tekhn. fiz. 35
no.9:1675-1677 S '65. (MIRA 18:10)

1. Fiziko-tekhnicheskiy institut imeni A.F.Ioffe AN SSSR, Leningrad.

SHAMOV, A.N.; DONSKOY, A.V., prof., doktor tekhn. nauk retsenzent;
FOGEL', A.A., kand. tekhn. nauk, red.

[Power supply of high-frequency heating systems from
large electric generators] Pitanie vysokochastotnykh na-
grevatel'nykh ustroystv ot mashinnykh generatorov. Izd.3.,
Pod red. A.A.Fogelia. Moskva, Mashinostroenie, 1965. 57 p.
(Bibliotekha vysokochastotnika-termista, no.10)

(MIRA 19:1)

BOGDANOV, V.N.; DONSKOY, A. V., doktor tekhn. nauk, retsenzent;
FOGEL', A.A., kand. tekhn. nauk, red.

[High-frequency welding of metals] Vysokochastotnaya
svarka metallov. Pod red. A.A.Fogelia. Moskva, Mashino-
stroenie, 1965. 65 p. (Bibliotekha vysokochastotnika
termista, no.11) (MIRA 19:1)

SUDAKOV, P.M.; DONSKOY, A.V., doktor tekhn. nauk, prof., retsenzent;
FOGEL', A.A., kand. tekhn. nauk, red.

[Equipment and measurements in high-frequency heating] Pri-
bory i izmereniia pri vysokochastotnom nagreve. Izd.2.,
ispr. i dop. Pod. red. A.A.Fogelia. Moskva, Mashinostroenie,
1965. 73 p. (MIRA 18:12)

VASIL'YEV, A.S.; DONSKOY, A.V., doktor tekhn. nauk, prof.,
retsenzent; FOGEL', A.A., kand. tekhn. nauk, red.

[Electron-tube oscillators for high-frequency heating]
Lampovye generatory dlia vysokochastotnogo nagreva.
Moskva, Mashinostroenie, 1965. 81 p. (Bibliotekha vy-
sokochastotnika-termista, no.9) (MIRA 18:11)

DERICHEV, A.D.; GOLOVIN, G.F.; SHASHKIN, S.V.; DONSKOY, A.V.,
doktor tekhn. nauk prof., retsenzent; FOGEL', A.A.
kand. tekhn. nauk, red.

[High-frequency hardening] Vysokochastotnaia zakalka.
Izd.3., ispr. i dop. Pod red. A.A.Fogelia. Moskva,
Mashinostroenie, 1965. 83 p. (MIRA 18:12)

L 36943-66 EWT(m)/EWP(t)/ETI/EWP(k) IJP(c) JD

ACC NR: AP6021443

(A)

SOURCE CODE: UR/0413/66/000/011/0050/0050

INVENTOR: Fogel', A. A.; Naydenov, A. F.

ORG: none

TITLE: A method of levitating a conducting liquid in an electromagnetic crucible.
Class 21, No. 182263

SOURCE: Izobreteniya, promyshlennyye obraztsy, tovarnyye znaki, no. 11, 1966, 50

TOPIC TAGS: levitation condition, ~~conducting liquid~~, electromagnetic field, electromagnetic crucible, constrained condition, CONDUCTIVE FLUID, FLUID SURFACE

ABSTRACT: This Author Certificate introduces a method of levitating a conducting liquid in an "electromagnetic crucible." To increase the amount of the liquid, it is constrained by surfaces of negative curvature formed by the action of a non-homogeneous electromagnetic field which is asymmetric in relation to a geometric line along which the field intensity is zero, and is maintained at a required height above the stationary positions of the surfaces having a positive curvature. [WW]

SUB CODE: 20 / SUBM DATE: 25Oct62/ ATD PRESS: 5038

Cord 1/1 lll

UDC: 621.365.52-219.5:538.313

GOGIBERIDZE, A.A., kandidat sel'skokhozyaystvennykh nauk; FOGEL', A.N.

Raising chayote. Priroda 42 no.11:110-111 N '53.

(MIRA 6:11)

1. Vsesoyuznaya selektsionnaya stantsiya vlashno-subtropicheskikh kul'tur
(Sukhumi) (for Fogel).

(Chayote)

SOURCE: USSR
 SUBJECT: Cultivated Plants. Medicinal. Essential Oil
 Bearing. Toxins.
 ACC. GROUP: Ref Zhur-Biologiya, No.1, 1959, No. 1873
 REFERENCE: Bokareva, L.I.; Fogel', A.N.
 LITERATURE: All-Union Collection Station on Humid Sub-
 tropical Cereals of Flowering and Seed Setting
 in the Bigflower Javata (Cerealia stans
 Benth.).
 ORIG. TITLE: Botan. zh., 1957, 42, No.3, 1215-1220
 ABSTRACT: Research made at the All-Union Selection
 Station of Humid Subtropical Cereals at
 Sukhumi in 1950-1957. Characteristic of javata
 flowers. Supplementary
 pollination performed 3-6 times during large-
 scale flowering (in the morning and evening
 during the period of most intensive blossoming;
 application during budding of potassium fer-
 tilizers at 50 kg, phosphorus at 40 kg and
 side-dressings of liquid manure fertilizers

TARD: 1/3
 "Tropical Cereals in Sukhumi

SECRET
NO DISSEM

U.S. FOR. REL. Mon-Biologiya. No. 1, 1959, p. 1873

1. SHOR
2. ST.
3. MEI

1976. Feb. :

1955/105 : bearing seed setting by as much as 56 per-
cent. augmented their size 1 on 2 at 2.5
cm. their absolute weight from 5 to 6.5-
6.7. The plants which were grown from
seed in comparison with those gotten by
vegetative reproduction have greater
growth dynamics (61 against 60 cm). increas-
ed energy of shoot formation, better folia-
tion and higher weight of the plant raw
: material mass from the roots (535 mg against

7450: 2/3

SOURCE
CATEGORY

AN. JOUR. Dof Zaur-Biologiya, Vol. 1959, No. 1873

ANALYST
INSTR.
TITLE

ORIG FILE

ABSTRACT : 300 (2000) - N.P. Novosel'tova

CARD: 3/3

BOKAREVA, L.I.; GOGIBERIDZE, A.A.; FOGEL', A.N.

Cultivation of turmeric in the Soviet subtropics. Agrobiologika
no.4:136-139 J1-Ag '58. (MIRA 11:9)

1. Sukhumskaya opyt'naya stantsiya subtropicheskikh kul'tur
Vsesoyuznogo instituta rasteniyevodstva.
(Turmeric)

BOKAREVA, L.I.; FOGEL', A.N.

Morphological changes in the blossoms of Java tea (*Orthosiphon
stamineus* Benth.) caused by meteorological conditions. Biul. Glav.
bot. sada no.30:41-46 '58. (MIRA 11:6)

1. Sukhumskaya opytaya stantsiya Vsesoyuznogo instituta
rasteniyevodstva.
(Abkhazia--Java tea) (Inflorescence) (Abnormalities (Plants))

FOGEL', Dmitriy Nikolayevich; MAKHNOVETSKIY, Solomon Iosifovich; SOSHNI-
KOV, M.N., red.; MIKHAYLOVA, L.G., red. izd-va; LOBANKOVA, R.Ye.,
tekhn. red.

[Possibilities for developing the lumbering industry in the region
of the Angara Valley Hydroelectric Power Station Cascade; utiliza-
tion of forests in flooded areas] Perspektivy razvitiia lesnoi pro-
myshlennosti v raione Angarskogo kaskada GES; osvoenie lesov na
zatopliaemykh territoriyakh. Moskva, Goslesbumizdat, 1961. 125 p.
(MIRA 14:9)

(Angara Valley—Lumbering)

FOGEL', G. [Fohel', H.]

Kilning bricks using liquid fuels. Sil'. bud. 7 no.5:13
Mr '57. (MIRA 13:6)

1. Glavnyy inzhener Khersonskogo oblastnogo upravleniya
po stroitel'stvu v kolkhozakh.
(Kherson Province--Brickmaking)

GUR'YEV, Viktor Vasil'yevich [deceased]; MAKHOVETSKIY, Solomon
Iosifovich; SSCRIN, Vladimir Aleksandrovich; FOGEL', D.M.,
red.

[Principles and methods of the organization of permanent
lumbering enterprises] Osnovy i puti organizatsii postoi-
no deistvuiushchikh lesozagotovitel'nykh predpriyatii. Mo-
skva, Lesnaia promyshlennost', 1964. 287 p.
(MIRA 18:3)

FOGEL', G. N.

Postoiannye formy dlia otlivki metallicheskikh izdelii: obzor izobretenii. Pod red. V. M. Shestopal. Moskva, Gosplanizdat, 1946. 76 p. diags.

44-258917

Permanent molds for casting metallic articles; survey of inventions.

DLC: TS233.F6

SO: Manufacturing and Mechanical Engineering in the Soviet Union, Library of Congress, 1953.

PROCESS AND PROPERTIES INDEX																									
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<p>FOGEL, Imte</p> <p style="text-align: right;">26</p> <p>Improvement of textile materials of rayon or of mixed fibers. Invc. Fogel, Hung. 131,246, Feb. 15, 1963. The usual methods for treating cellulose derivs. are combined with a treatment that produces artificial resins and a treatment for making the fibers hydrophobic. I. F.</p>																									
<p>ASB-SLA METALLURGICAL LITERATURE CLASSIFICATION</p>																									
<p>REGION SYMBOLS</p>													<p>AUTHOR INDEX</p>												
<p>100 101 102 103 104 105 106 107 108 109 110 111 112</p>													<p>113 114 115 116 117 118 119 120 121 122 123 124 125</p>												